ABSTRACT OF THE DISCLOSURE

A segmentation and re-assembly (SAR) decode engine receives protocol data units of data from a communication channel between two computers, sequences the protocol data units, and re-assembles the data in the protocol data units into the messages exchanged by the computers. The SAR decode engine is responsible for unpacking the payloads from the protocol data units as instructed by a protocol interpreter associated with the protocol data unit, and for creating and maintaining a flow object database containing flow objects representing the data flows at each protocol layer. The SAR decode engine creates a protocol flow object for each protocol layer and logically links the protocol flow object to circuit flow objects that define two one-way circuits within the channel. The circuit flow objects linked to a protocol flow object are logical representations of the protocol data units for the next higher protocol layer. For protocols that fragment data, each circuit flow object is a vector list containing one or more vectors that define the length, starting location and position of the data fragments in the immediately lower layer circuit flow objects.